

DOE This Month



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Australia, U.S. To Exchange Data

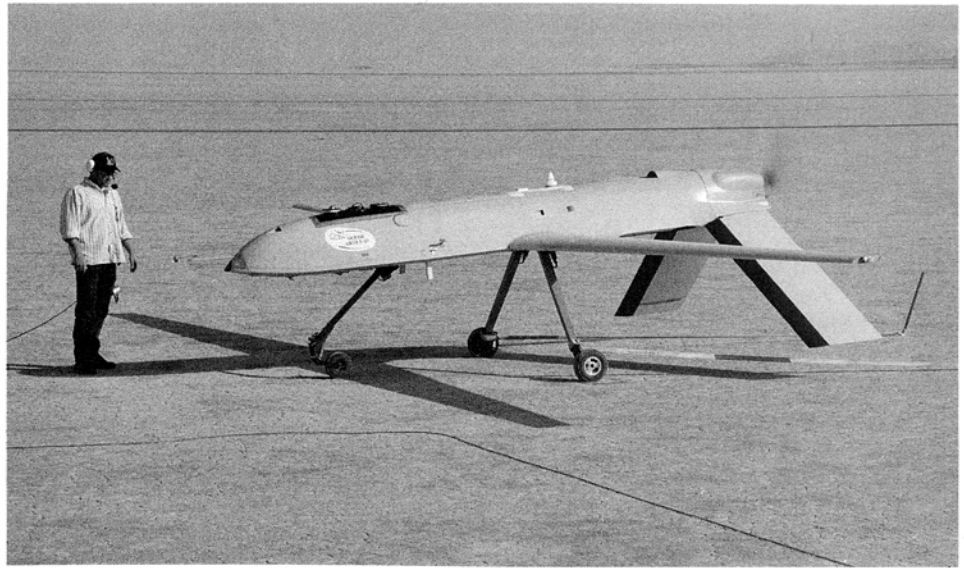
An agreement calling for the exchange of research data on health effects of exposure to electric and magnetic fields has been signed by DOE and the Australian Ministry for Primary Industries and Energy.

The agreement was signed last month at Parliament House in Canberra, Australia, by U.S. Ambassador Edward Perkins and the Australian Minister for Primary Industries and Energy, Senator Bob Collins.

An electric and magnetic fields research effort under way in the United States by Federal agencies, states, and the private sector has been expanded by a 5-year program under the Energy Policy Act of 1992 and has an authorization of \$65 million.

Los Alamos National Laboratory reports cells taken from citrus plants, Black Mexican Sweet Corn, and jimsonweed share an ability to bind with certain heavy metals and chemicals found in explosives. A Lab scientist has patented a process that uses such plant cells to purify liquids contaminated with heavy metals or TNT. All three plant types removed barium, iron, and plutonium metals to levels below a part per million. Living cells of jimsonweed, grown in a contaminated medium, also removed TNT, other explosives, and their byproducts. (John Gustafson, 505-667-7000)

The Fermi National Accelerator Laboratory has entered into a Cooperative Research and Development Agreement with the University of Michigan to create a new type of x-ray "camera" for cancer radiation treatments. The device will make it possible for oncologists to see in real-time, through a computer screen, where a radiation beam is focused in a patient's body, and will verify how much of a radiation dose the patient receives. The CRADA is the first for Fermilab. (Barbara Lach, 708-840-3351)



AEROSPACER—For 3 weeks last month, DOE's Atmospheric Radiation Measurement (ARM) program collected climate research data over north-central Oklahoma using an unmanned aerospace vehicle. The GNAT 750-45, a rear propeller driven aircraft, has a gross weight of 540 kilograms (1,200) pounds and a wingspan of 10.5 meters (35 feet). It can carry 72 kilograms (160 pounds) of instrumentation, primarily five radiometers to measure the radiant energy from the sun and the earth passing through the atmosphere at altitudes between 450 and 6,600 meters (1,500 and 22,000 feet). The ARM program of office and science director are located at Pacific Northwest Laboratory. Technical Director of the unmanned aerospace vehicle program is John Vitko of Sandia National Laboratories. (Lee Somerstein, 509-375-6697)

Tracking the Comet Crash on Jupiter

Los Alamos Alert

This July, when the 20 or so fragments of comet Shoemaker-Levy slam into Jupiter, Los Alamos scientists hope to be listening. If the timing works out between the fragments hitting Jupiter, travel time of radio signals to Earth, and position of the ALEXIS satellite in orbit, scientists will program the Blackbeard receiver onboard ALEXIS to listen for radio emissions created as the comet fragments pass through and distort Jupiter's ionosphere.

Confirming Theories

The observations, if successful, will help confirm theories of how the energy delivered by the comet pieces couples to Jupiter's immense ionosphere. Blackbeard, which can record a wide range of radio frequencies simultaneously, recently discovered radio bursts coming from an as-yet unknown source in Earth's atmosphere. (Rod Geer, 505-667-7000)

Sandia Standing By

Researchers at Sandia National Laboratories are using the world's fastest supercomputer (the 1840-CPU Intel Paragon) to learn more about what will happen when comet fragments the size of a mountain collide with Jupiter. Many of the fragments are 2 to 4 kilometers in diameter and will plunge one-by-one into Jupiter. Using computer codes of the type originally developed to model nuclear weapon blast effects, Sandia scientists began calculating the comet's effects last year. The researchers are concerned mainly with the processes that are expected to cause the disintegration of the comet pieces as they travel through Jupiter's atmosphere. Orbits calculated from new images taken by the recently repaired Hubble Space Telescope put the impacts close to the limb of Jupiter—its horizon as seen from the Earth. (A.C. Etheridge, 505-844-7767)